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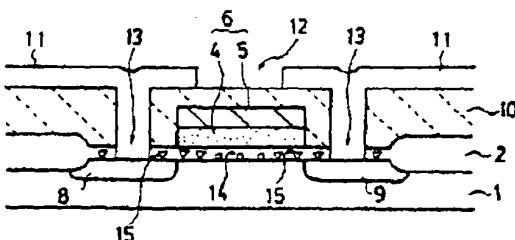
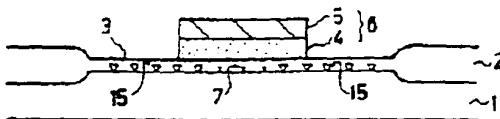
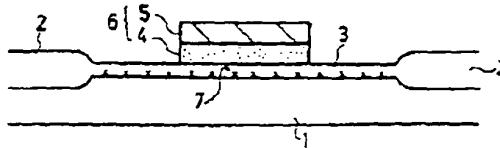
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APPLICANT : FUJI XEROX CO LTD;

INVENTOR : MURATA MICHIAKI;

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TITLE : MOS FIELD-EFFECT TRANSISTOR
 AND MANUFACTURE THEREOF



ABSTRACT : PURPOSE: To arrange that hydrogen-terminated silicon atoms are hardly returned to an interface level by hot electrons generated during an operation and to stabilize an operating characteristic by a method wherein silicon atoms bonded to halogen atoms are contained in a gate oxide film near a drain region.

CONSTITUTION: A gate electrode 6 is formed; and after that, it is heat-treated in an atmosphere of a mixed gas of a halogen element, e.g. chlorine Cl₂, oxygen O₂ and nitrogen N₂. The chlorine creeps from the surface of a gate oxide film 3; it is diffused into the gate oxide film 3; and it is bonded to interface-level silicon atoms 7 near the boundary between the gate oxide film 3 and a silicon substrate 1. As a result, bonding pairs of silicon atoms having no bonding partner are terminated at the chlorine and are changed to chlorine-terminated silicon atoms 15. Since the bonding strength of chlorine atoms Cl to silicon atoms Si is stronger than the bonding strength of hydrogen atoms 11 to silicon atoms Si, their bonded state is not detached by hot electrons. Consequently, electrons during an operation are not scattered and an operating characteristic is not worsened.

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